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XXVII. *A Description of a Pump-Engine, or an Apparatus to be added to a common Pump, to answer the Purpose of a Fire-Engine ; invented by Mr. BENJAMIN DEARBORN : Extracted from his Letters to the Hon. JAMES BOWDOIN, Esq; President : communicated by the President.*

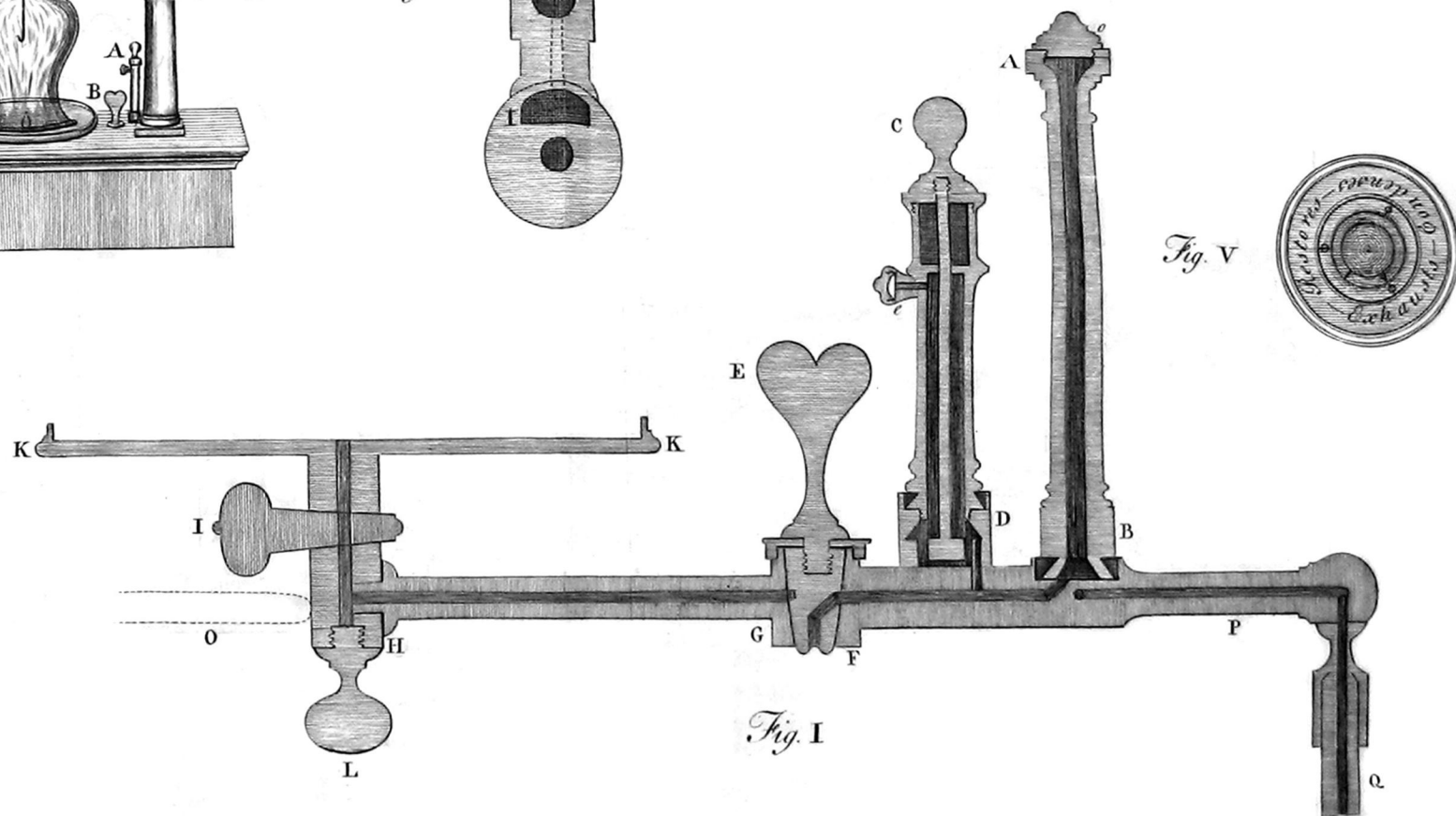
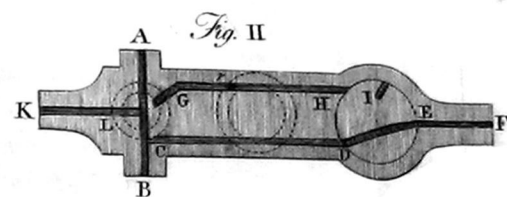
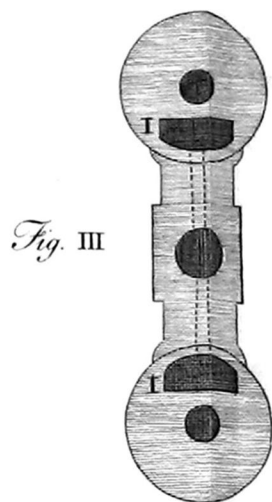
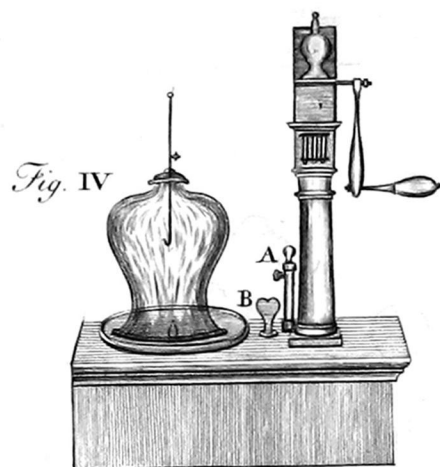
Portsmouth, November 5, 1781.

S I R,

**I** HAVE spent some time in inventing the pump-engine, a model of which I have forwarded herewith. This engine is described as follows.

Plate VI. Fig. 3. A B C D represents a pump in the form of a common ship-pump. E its spout. F a stopper. D d is a plank cap, fitted with leather under it to the pump, and screwed down by the screws *a b* ; having a hole in the center for the spear of the pump to pass through, round which a leather collar is made, as *c*. *g* is a nut for the screw *b*. *f b* is a square piece of wood, nailed across one end of the cap, the screw *a* passing through it and the cap ; through this piece and the cap a hole is made, communicating with the bore of the pump. G G is a wooden tube (of any required length or number of joints) made square at the lower end, and hollowed to receive the cock, the upper end being made with a nice shoulder. *e* is a wooden cock, which opens or shuts the communication between the pump and the tube, having a handle on the opposite side, with a lock if necessary. *b b* are ferrules to prevent the tube from splitting. H H are braces, each of which must have another crossing it as nearly at right angles as may be. *i i* are irons in the form of a staple, going round the tube and through the braces, having holes in their ends for forelocks. K L M N is a head made of five pieces of wood, viz.

*k l m n*



*k l m n*, a square piece, with a hole in the lower end, to receive the end of the tube, and rests on the shoulder *o p*; on the lower end of this head a leather is nailed, having a hole in its centre similar to the hole in the wood; another leather of the same form is put on the top of the tube, and a circle of thin plate-brass between them; the two leathers and the brass being pressed between the lower end of the head and the shoulder of the tube; their edges are represented by *o p*. *K N* and *L M* are the edges of two pieces of plank which are as wide as the head, and nailed fast to it, each of them having a tenon going through a mortice in the end of the piece *O P*; each tenon has a hole for a forelock at *q q*. *O P* is a piece of plank as wide as the sides, having a hole in its centre through which the tube passes, and a mortice on each end for the tenons to pass through. *N M* is a cap. *r r* are two pieces nailed on the side of the tube, with a truck in the lower end of each, to lessen the friction of the head in its horizontal revolution. *q q* are forelocks to wedge the head down, and prevent the water from finding a passage out at the joint *o p*. *Q R* is a wooden conductor; the end *Q* being solid, the end *R* bored with a small auger, *s* is a bolt going through the conductor and head, secured on the back with a forelock or nut; this bolt is round near the head and square in the middle. *t u w x* is a piece of iron or brass to prevent the head of the bolt from wearing into the wood. *S S* are ropes to direct the conductor.

Fig. 4. is the head without the conductor; *a b c d* is a thick brass plate perforated to prevent dirt from clogging the conductor, and nailed with leather under it to the head. The square hole in the centre is made to the size of the bolt, and prevents it from turning. The conductor has a hollow cut

*S f f*

round

round the bolt on the inside, as large as the circle of holes in the brass, round which hollow on the face of the conductor, a leather is nailed which plays on the margin of the brass plate, when the conductor turns.

I have raised a tube of 30 feet on my pump, but the severity of the season prevents my completing it; having so far executed it only, as for one person to work at the brake; I can myself throw water on the top of a neighbouring building, the nearest part of which is 37 feet from the pump, and between 30 and 40 feet high.

